

We claim:-

1. A process for the treatment of paper surfaces, wherein the surface of the paper is coated with particles (composite particles) which are composed of polymer and finely divided inorganic solid, the weight average particle size of the finely divided inorganic solid being ≤ 100 nm.
2. A process as claimed in claim 1, wherein the composite particles are applied in the form of an aqueous composite particle dispersion to the paper.
3. A process as claimed in claim 2, wherein the aqueous composite particle dispersion was prepared by a process in which at least one ethylenically unsaturated monomer is dispersed in an aqueous medium and polymerized by means of at least one free radical polymerization initiator in the presence of at least one dispersed, finely divided inorganic solid and at least one dispersant by the aqueous free radical emulsion polymerization method,
 - a) a stable aqueous dispersion of the at least one inorganic solid being used, which dispersion, with an initial solids concentration of $\geq 1\%$ by weight, based on the aqueous dispersion of the at least one inorganic solid, still contains more than 90% by weight of the originally dispersed solid in dispersed form one hour after its preparation and whose dispersed solid particles have a weight average diameter of ≤ 100 nm,
 - b) the disperse solid particles of the at least one inorganic solid having an electrophoretic mobility which differs from zero in an aqueous standard potassium chloride solution at a pH which corresponds to the pH of the aqueous dispersing medium before the beginning of the addition of the dispersants,
 - c) at least one anionic, cationic and nonionic dispersant being added to the aqueous solid particle dispersion before the beginning of the addition of the at least one ethylenically unsaturated monomer,
 - d) thereafter from 0.01 to 30% by weight of the total amount of the at least one monomer being added to the aqueous solid particle dispersion and being polymerized to a conversion of at least 90%

and

- e) the remaining amount of the at least one monomer then being added continuously under polymerization conditions at the rate at which it is consumed.
- 5 4. A process for the treatment of paper surfaces, wherein the surface of the paper is treated with an aqueous dispersion which is obtainable by mixing an aqueous polymer dispersion with at least one dispersed, finely divided inorganic solid which has a weight average particle diameter of ≤ 100 nm.
- 10 5. A process as claimed in any of claims 1 to 4, wherein the amount of composite particles or of a mixture of dispersion polymer and finely divided inorganic solid is from 0.1 to 100 g/m² of paper.
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- 15 6. A process as claimed in any of claims 1 to 5, wherein the polymer can be formed into a film.
7. A process as claimed in any of claims 1 to 6, wherein the paper used is a base paper.
- 20 8. A process as claimed in any of claims 1 to 6, wherein the paper used is a coated or sized paper.
- 25 9. A process as claimed in any of claims 1 to 8, wherein the finely divided inorganic solid is selected from the group consisting of silica, alumina, hydrated aluminum oxide, calcium carbonate, magnesium carbonate, calcium orthophosphate, magnesium orthophosphate, iron(II) oxide, iron(III) oxide, iron(II/III) oxide, tin oxide, cerium dioxide, yttrium(III) oxide, titanium dioxide, hydroxyapatite, zinc oxide and zinc sulfide.
- 30 10. A process as claimed in any of claims 1 to 9, wherein the treated paper is subjected to pressures and/or temperatures such that the polymer forms a film.
11. A paper obtainable by a process as claimed in any of claims 1 to 10.
- 35 12. The use of a paper as claimed in claim 11 in the offset, flexographic and gravure printing process.
13. A printed paper obtainable by the use as claimed in claim 12.

14. The use of an aqueous dispersion of particles which are composed of polymer and finely divided inorganic solid, the weight average particle size of the finely divided inorganic solid being ≤ 100 nm, for the coating of paper.
- 5 15. The use of an aqueous dispersion which is obtainable by mixing an aqueous polymer dispersion with at least one dispersed, finely divided inorganic solid which has a weight average particle diameter of ≤ 100 nm for the coating of paper.